

# Magnetic sensing with laser-synthesized nanodiamonds

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Nitrogen-vacancy (NV)-doped nanodiamonds (NDs) have applications in quantum-sensing of temperature and magnetic fields. We succeeded in ns laser-synthesis, from graphite, of fluorescent NV-NDs w/o any post-process activation as opposed to current production techniques. Proof of NDs formation is given by SAED, SEM and Raman spectroscopy. NV centers are probed by spectrally-resolved Optically Detected Magnetic Resonance. A thermodynamic model was developed to explain NDs formation under ns laser ablation. Advanced room-T opto-magnetic sensing properties of our NDs are reported.

1. M. Cazzanelli, L. Basso, E. Moser, N. Bazzanella, and A. Miotello. Subm. Nanoletters (2019)
2. L. Basso, N. Bazzanella, M. Cazzanelli, and A. Miotello. Carbon 153, 148 (2019).
3. L. Basso, F. Gorrini, M. Cazzanelli, N. Bazzanella, A. Bifone, and A. Miotello, Nanoscale 10, 5738 (2018).
4. L. Basso, F. Gorrini, N. Bazzanella, M. Cazzanelli, C. Dorigoni, A. Bifone, and A. Miotello, Appl. Phys. A 124, 72 (2018).